



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT



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8 January 2009

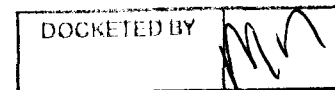
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Docket Control Division
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1200 West Washington Street
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Arizona Corporation Commission

DOCKETED

JAN - 9 2009



Re: Docket No. E-01345A-08-0172

Dear Sir/Ma'am

Enclosed please find an original and thirteen copies of the Testimony of Dr Larry Blank on behalf of Federal Executive Agencies, for filing in the above-captioned case.

Thank you for your assistance in this matter.

Sincerely,

KAREN S. WHITE, Esq.
Staff Attorney
Air Force Utility Litigation & Negotiation Team

Attach:

Testimony of Dr Larry Blank
+ 13 copies

AZ CORP COMMISSION
DOCKET CONTROL

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RECEIVED

Original and thirteen (13) copies of the
Foregoing filed this 8th day of
January 2009 with:

Docket Control Division
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1200 West Washington Street
Phoenix, Arizona 85007

A copy of the foregoing was mailed/*emailed this
8th day of January 2009 to:

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By: 
KAREN S. WHITE, Esq.

BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

MIKE GLEASON, Chairman

WILLIAM A. MUNDELL

JEFF HATCH-MILLER

KRISTIN K. MAYES

GARY PIERCE

IN THE MATTER OF THE APPLICATION
OF ARIZONA PUBLIC SERVICE COMPANY
FOR A HEARING TO DETERMINE THE FAIR
VALUE OF THE UTILITY PROPERTY OF THE
COMPANY FOR RATEMAKING PURPOSES,
TO FIX A JUST AND REASONABLE RATE OF
RETURN THEREON, TO APPROVE RATE
SCHEDULES DESIGNED TO DEVELOP SUCH
RETURN.

DOCKET NO. E-01345A-08-0172

NOTICE OF FILING TESTIMONY

Federal Executive Agencies (FEA), by and through the undersigned attorney, representing all
Federal customers of Arizona Public Service Company, hereby provides notice of filing the
Direct Testimony of Dr Larry Blank in this proceeding.

RESPECTFULLY SUBMITTED this 8th day of January 2009.

FEDERAL EXECUTIVE AGENCIES

By: Karen S White

KAREN S. WHITE, Esq.

AZ Bar No. 016820

Staff Attorney, AF Utility Litigation & Negotiation Team

139 Barnes Drive, Ste 1

Tyndall AFB FL 32403

BEFORE THE ARIZONA CORPORATION COMMISSION

**In the Matter of the Application of)
Arizona Public Service Company for a)
Hearing to Determine the Fair Value of)
the Utility Property of the Company for)
Ratemaking Purposes, to Fix a Just and)
Reasonable Rate of Return Thereon, to) Docket No. E-01345A-08-0172
Approve Rate Schedules Designed to)
Develop Such Return)
)**

DIRECT TESTIMONY

OF

LARRY BLANK

ON BEHALF OF

THE FEDERAL EXECUTIVE AGENCIES

January 8, 2009

IDENTIFICATION

Q. PLEASE STATE YOUR NAME AND ADDRESS FOR THE RECORD.

A. My name is Larry Blank. My business address is 2533 North Carson St., Suite 3624, Carson City, NV 89706.

Q. PLEASE STATE YOUR PROFESSIONAL POSITION(S).

A. I am the principal of TAHOEconomics, LLC, ("Tahoe") a Nevada-registered consulting company I founded in August 1999, specializing in most facets of regulated utility industries. I also serve (since 2003) on the faculty of the Dept. of Economics and the Center for Public Utilities, both housed in the College of Business, New Mexico State University. For the purposes of this proceeding, I have been engaged through Tahoe.

Q. PLEASE PROVIDE A BRIEF SUMMARY OF YOUR BACKGROUND AS IT IS RELEVANT TO THIS TESTIMONY.

A. I have served the public in various capacities for about twenty (20) years. I received a Ph.D. in Economics from The University of Tennessee in 1994, specializing in Industrial Organization & Public Policy (including regulatory policy), Econometrics, and Finance. I previously served as an Economist with the National Regulatory Research Institute and later as the Manager of Regulatory Policy & Market Analysis with the Regulatory Operations Staff of the Nevada Public Utilities Commission. My division's responsibilities in Nevada included tariff and rates analysis for all regulated utilities in that jurisdiction as well as expert witness testimony on the same. As a consultant, I have served a variety of clients including regulatory agencies, utility customers, utility companies, and the U.S. Department of Energy

1 as the Project Director for technical assistance to the Energy Regulatory Commission in the
2 Philippines. A more complete resume is included as Exhibit LB-1 to my testimony.

3 **Q. WHAT EXPERIENCE DO YOU BRING TO THIS CASE?**

4 A. I have served as an expert witness and/or advisor in over 100 rate cases of various types. I
5 have previously filed written testimony and/or prepared rates-related filings in the following
6 utility regulatory commission jurisdictions: New Mexico, Nevada, Montana, Texas,
7 Arkansas, Hawaii, and the Federal Energy Regulatory Commission ("FERC"). I have served
8 as an advisor to the Maryland Public Service Commission and the Energy Regulatory
9 Commission of the Philippines in rate case proceedings and deliberations. I also teach
10 advanced graduate utility regulation to Masters of Economics students at New Mexico State
11 University who have elected to specialize in this profession, and I help deliver nationally-
12 recognized rate case training programs endorsed by the National Association of Regulatory
13 Utility Commissioners and attended by regulatory professionals from across the United
14 States and abroad.

15 **PURPOSE AND SUMMARY**

16 **Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?**

17 At the request of legal counsel to the Federal Executive Agencies ("FEA"), I am responding
18 to certain aspects of the cost of service study and rate design proposals filed by Arizona
19 Public Service Company ("APS") in this case. Specifically, I will make recommendations for
20 consideration by the Arizona Corporation Commission ("ACC" or "Commission") on the
21 following topics: Jurisdictional Assignment of Transmission Services Costs; Customer
22 Class Rates of Return; and the proposed Demand Side Management Adjustment Charge.

1
2 **Q. PLEASE SUMMARIZE YOUR TESTIMONY.**

3 A. Jurisdictional Assignment of Transmission Services Costs. The cost of service study
4 sponsored by APS witness Mr. Rumolo lacks consistency and transparency with respect to
5 the assignment transmission services costs and revenues to the FERC jurisdiction. It also is
6 not clear whether the costs associated with key ancillary services have been properly
7 assigned to the FERC jurisdiction. If these observations are correct, the rate of return at
8 present rates has been understated by 0.44%. I also recommend separate accounting of
9 revenues collected from Schedule TCA-1 (Transmission Cost Adjustment) which will make
10 for a cleaner and more transparent separation of the FERC-jurisdictional rates and revenues.

11
12 Customer Class Rates of Return. The class rates of return for the General Service and Water
13 Pumping rate classes are significantly above a just and reasonable return. In an attempt to
14 gradually move all classes of customers closer to their respective cost of service, I
15 recommend in this case that the Commission limit any deviation from the final approved just
16 and reasonable return to be no more than 1% (plus or minus).

17
18 Demand Side Management Adjustment Charge. The Company has proposed to include an
19 Unrecovered Fixed Costs ("UFC") component in the proposed Demand Side Management
20 Adjustment Charge ("DSMAC") as sponsored by APS witnesses Mr. Pickles and Mr.
21 Delizio. The design of the DSMAC spreads all costs across all customer classes based on
22 energy (kWh) consumption. Applying this design to the UFC component will tend to shift

1 fixed-cost recovery between rate classes, which is inconsistent with the allocation of fixed
2 costs to rate classes in the general rate case. I recommend that the UFC component be
3 separated from the other components in the DSMAC and independently calculated for each
4 separate rate class as described in Mr. Pickles' direct testimony. I also recommend that the
5 Company be ordered to provide more details on the methodologies to be followed in
6 estimating the kWh impacts of utility DSM programs.

7
8 **JURISDICTIONAL ASSIGNMENT OF TRANSMISSION SERVICES COSTS**
9

10 **Q. IS THE JURISDICTIONAL ALLOCATION OF COSTS PART OF THE APS COST**
11 **OF SERVICE STUDY?**

12 A. Yes, it is important to assign or justly allocate costs between the ACC jurisdiction (retail
13 customers) and the FERC jurisdiction (wholesale customers), and this separation of costs is
14 performed within the APS cost of service study. As stated in Mr. Rumolo's direct testimony
15 (pp. 1-2), "[f]orth, I discuss the cost-of-service study prepared to functionalize, classify, and
16 then allocate test year costs and revenues, first between wholesale and retail customers, and
17 then to the various classes of retail service." The adjusted cost of service study was filed in
18 Mr. Rumolo's workpapers as DJR_WP-1.

19 **Q. HAVE YOU REVIEWED THE JURISDICTIONAL SEPARATION OF**
20 **TRANSMISSION SERVICES COSTS SPONSORED BY MR. RUMOLO IN THE**
21 **COMPANY'S COST OF SERVICE STUDY?**

22 A. Yes. As explained in Mr. Rumolo's Direct Testimony, "...the revenue requirement for
23 transmission services was computed based on the FERC-jurisdictional rates found in the APS

1 Open Access Transmission Tariff ("OATT")." (p. 23, lines 19-22). "In this application, the
2 Company proposes that the FERC-regulated charges be removed from base rates and directly
3 charged to customers through a separate transmission rate schedule, TCA-1 [Transmission
4 Cost Adjustment], that would directly incorporate by reference the Company's then-effective
5 OATT charges." (p. 24, lines 3-7).

6 **Q. DO YOU OPPOSE THE COMPANY'S PROPOSED SCHEDULE TCA-1?**

7 A. If all of the related service costs and revenues are directly assigned to the non-ACC
8 jurisdiction in the cost of service study, then I am not opposed to the Adjustment Schedule
9 TCA-1 ("TCA").

10 **Q. WHAT SERVICES ARE INCLUDED IN SCHEDULE TCA-1 AND IS THE**
11 **COMPANY'S TREATMENT OF EACH OF THESE SERVICES IN THE COST OF**
12 **SERVICE STUDY TRANSPARENT AND CONSISTENT?**

13 A. Proposed Schedule TCA-1 includes the following five services: 1. Network Transmission; 2.
14 Scheduling; 3. Regulation; 4. Spinning Reserve; and 5. Operating Reserve. Because the
15 TCA utilizes the FERC-accepted rates, these rates are not subject to the ACC's
16 determination; however, the costs and revenues associated with these services are included in
17 the cost of service study and should be assigned to the FERC jurisdiction. The Company has
18 clearly assigned the 100% costs associated with the first two services (Network Transmission
19 and Scheduling) to the FERC jurisdiction but has not assigned the revenues associated with
20 these two services to the FERC jurisdiction (see Note 2, Schedule H-1). Instead, the
21 Company inserts into operating expenses for the ACC jurisdiction what appears to be the
22 revenue requirement for these two services in the amount of \$103,578,233 (see Mr.

Direct Testimony of Larry Blank
On behalf of the Federal Executive Agencies

ACC Docket No. E-01345A-08-0172

Page 6

1 Rumolo's workpaper DJR_WP-1, p.61, line 36). It is unclear where this number came from
2 because there is no cross-reference in the cost of service study. It is also unclear whether this
3 amount perfectly matches the adjusted revenue for Network Transmission and Scheduling
4 embedded in the ACC-jurisdictional operating revenues (DJR_WP-1, p. 1, line 22), which is
5 used to calculate the Adjusted Operating Income and Current Rate of Return in Schedule A-
6 1, lines 2 and 3, respectively. It would be far more transparent and consistent with the
7 treatment of the costs if the revenues associated with TCA services were separately
8 accounted for and completely assigned to the FERC jurisdiction.

9 The treatment of the remaining three services (Regulation, Spinning Reserve, and
10 Operating Reserve) is even less transparent because it is not clear whether the costs
11 associated with these services have been assigned to the FERC jurisdiction. At the time of
12 writing this testimony we have pending interrogatories to APS on this subject, and the
13 responses to which may shed more light and possibly modify the testimony that follows.
14 However, I have yet to find an assignment of these costs to the FERC jurisdiction in a
15 manner consistent with the treatment of the first two TCA services. It does appear that the
16 Company included the revenue requirement for these three services ("Ancillary Services") as
17 an operating expense at line 7 of p. 61, DJR-WP-1 in the amounts of \$23,527,521 and
18 \$1,237,320 for the ACC and FERC jurisdictions, respectively. As in the case of the first two
19 TCA services, this revenue requirement is included as an operating expense because the
20 revenue for these Ancillary Services is embedded in the ACC-jurisdictional operating
21 revenues (DJR_WP-1, p. 1, line 22). As I mentioned earlier, the TCA operating revenue
22 should be separately accounted for and assigned to the FERC jurisdiction. Of greater

1 concern is that there is no indication that the costs of these Ancillary Services have been
2 properly assigned to the FERC jurisdiction.

3 **Q. IS IT NOT THE CASE THAT THESE ANCILLARY SERVICES ARE**
4 **TRANSMISSION SERVICES AND, THEREFORE, WOULD THE COSTS BE IN**
5 **THE TRANSMISSION ACCOUNTS ASSIGNED TO THE FERC JURISDICTION?**

6 A. As defined by the FERC, there are seven transmission ancillary services; namely,
7 Scheduling, System Control and Dispatch Service ("Scheduling"); Reactive Supply and
8 Voltage Control; Regulation and Frequency Response Service ("Regulation"); Energy
9 Imbalance Service; Spinning Reserve Service, and Supplemental Reserve Service (listed as
10 "Operating Reserve" in Schedule TCA-1). Unlike Scheduling, which has its own FERC
11 accounts, Regulation, Spinning Reserve and Operating Reserve services are provided by
12 generation capacity and, therefore, the costs associated with these services are either included
13 in the production accounts or as part of purchased power costs. That is, although these
14 ancillary services are technically "transmission services", the related costs do not appear in
15 the transmission accounts. In recent years, the FERC has mandated a new schedule in FERC
16 Form No. 1 (p. 398), in which the Company must report purchases and sales of ancillary
17 services, including sales to native load retail customers (p. 398 is attached hereto as Exhibit
18 LB-2).¹ However, the costs are accounted for in non-transmission accounts. As I stated
19 earlier, the Company's cost of service study does not specifically assign these costs to the
20 FERC jurisdiction. Regardless of where the costs are recorded, the costs need to be directly
21 assigned to the FERC jurisdiction in a fashion consistent with the Company's treatment of

¹ FERC Order No. 646-A, Docket No. RM03-8-001, June 2, 2004.

1 the transmission accounts and scheduling accounts. Failure to make such a cost assignment
2 will result in double-recovery of these costs.

3 **Q. WHAT ARE THE IMPLICATIONS OF YOUR OBSERVATIONS ON ANCILLARY**
4 **SERVICE COSTS?**

5 A. If the Ancillary Services costs are not directly assigned to the FERC jurisdiction, the total
6 cost of service for the ACC jurisdiction has been overstated by \$23,527,521. Assigning these
7 costs to the FERC jurisdiction would increase the adjusted operating income at present rates
8 from \$203,111,908 to \$226,639,429. Due to this understatement of operating income, the
9 rate of return at present rates for the ACC jurisdiction is understated by 0.44% (at original
10 cost). Therefore, Lines 1-8 of Schedule A-1 would be revised as presented in Exhibit LB-3
11 to my testimony and corresponding changes should be made throughout the APS filing.

12 **Q. DO YOUR OBSERVATIONS RAISE ANY CONCERNS REGARDING THE POWER**
13 **SUPPLY ADJUSTMENT?**

14 A. Yes. The power supply adjustment mechanism (Adjustment Schedule PSA-1) should not
15 include any costs related to Regulation, Spinning Reserve and Operating Reserve otherwise
16 we will see a double adjustment in both in both Schedules PSA-1 and TCA-1 and double-
17 recovery of costs. This may be an issue insofar as any of these costs are included in the
18 Purchased Power Account 555.

19 **Q. DO YOU HAVE ANY OTHER RECOMMENDATIONS REGARDING THIS**
20 **MATTER?**

21 A. Yes. I recommend that the Commission order the Company to begin maintaining separate
22 accounting of the revenues from Schedule TCA-1, itemized by each service and rate class

1 within the schedule. For the next rate case, these revenues can then be easily removed from
2 the ACC-jurisdictional operating revenues and assigned to the FERC jurisdiction which will
3 avoid the need for the Company to include the revenue requirements for Ancillary Services
4 and Network Transmission and Scheduling Services as it has done in the cost of service
5 study (DJR_WP-1) at p. 61, lines 7 and 36, respectively. This will make for a cleaner
6 separation of FERC-jurisdictional rates and revenues and avoid possible mismatch between
7 the rate-case-adjusted revenues and the revenue requirement for transmission services
8 "computed based on the FERC-jurisdictional rates..." (Rumolo Direct at p. 23, lines 20-21).
9

10 **CUSTOMER CLASS RATES OF RETURN**

11 **Q. DO YOU HAVE ANY CONCERNS REGARDING THE RATE-CLASS RATES OF**
12 **RETURN BASED ON THE COST OF SERVICE STUDY?**

13 A. The table below presents the Company's proposed percentage rate increases and rates of
14 return by rate class. Also included is the deviation for each rate class from the Company's
15 proposed just and reasonable overall rate of return (8.86% at original cost). Most notable is
16 the General Service and Water Pumping rates of return which are significantly above a
17 reasonable level by at least 1.69% and 4.33%, respectively. In an attempt to gradually move
18 all classes of customers closer to their respective cost of service, I would suggest in this case
19 that the Commission limit any deviation from a just and reasonable return to be no more than
20 1% (plus or minus) from the final approved rate of return.

Customer Class Rates of Return

Line No.		Proposed Revenue Increase	Proposed Rate of Return	Deviation from "Fair" Return
L1	Overall Company	10.55%	8.86%	TBD
L2	Residential	11.34%	7.62%	-1.24%
L3	General Service	9.71%	10.55%	1.69%
L4	Outdoor Lighting	15.05%	3.15%	-5.71%
L5	Dusk to Dawn	17.30%	9.69%	0.83%
L6	Water Pumping	4.46%	13.19%	4.33%

One way for the Commission to implement my recommendation would be to require that any ordered reductions in the proposed revenue requirements first be used to lower the General Service and Water Pumping customers' proposed rate increase to bring these rates closer to cost of service. This would imply a higher rate of return for the residential rate class, but low-income customers can still take advantage of the APS Residential Energy Support Program (Schedule E-3) which provides for up to a 40% total bill reduction for customers who meet the criteria based on 150% of the Federal poverty guidelines.

DSM ADJUSTMENT CHARGE

Q. HAVE YOU REVIEWED THE PROPOSED DSM ADJUSTMENT CHARGE?

A. Yes, I have reviewed the direct testimonies of Mr. Pickles and Mr. Delizio as well as the proposed Adjustment Schedule DSMAC-1 ("Demand Side Management Adjustment Charge" or "DSMAC").

Q. BASED ON THE DESCRIPTIONS PROVIDED BY APS, DO YOU HAVE CONCERNS REGARDING THIS PROPOSED MECHANISM?

1 A. The proposed DSMAC includes three components: Program Costs ("PC"), Unrecovered
2 Fixed Costs ("UFC"), and Performance Incentives ("PI"). Fixed costs are those that do not
3 change when kWh sales change; i.e., the demand-related and customer-related costs. My
4 concerns are related to the design of the UFC component of the DSMAC. The primary
5 concern is that the DSMAC is designed to spread all cost components, including UFC,
6 evenly across all customer classes based on kilowatt hour ("kWh") sales. In other words, the
7 decline in fixed-cost recovery in one rate class would be socialized to all rate classes. This is
8 problematic for two reasons. First, a particular DSM program may target a particular rate
9 class or classes more than other classes, thereby causing significant differences in kWh
10 reductions across customer classes. Shifting the fixed cost recovery of the rate class with
11 greater reduction in kWh to other customer classes is inconsistent with established
12 ratemaking principles as will be discussed below. Second, the differences in rate structure
13 and design across rate classes will tend to cause significant differences in the levels of
14 unrecovered fixed costs from one customer class to the next. Specifically, under-recovery of
15 fixed costs due to utility DSM programs is more likely in those customer classes without
16 demand (kW) charges, which ideally are implemented to recover the demand-related costs.
17 While a portion of demand-related costs could be recovered through the customer charge,
18 absent a demand charge, the demand-related costs are typically recovered through the energy
19 charge. In fact, in situations where the customer charge is relatively low – like in APS's
20 residential tariffs – the customer charge isn't even high enough to recover all the customer-
21 related costs. Therefore, all the demand-related costs and a portion of the customer-related
22 costs are recovered through the energy charge.

1 As stated by Mr. Delizio in his direct testimony,

2 “APS rates are designed to recover in each kilowatt hour sold a portion of the fixed
3 costs incurred to serve customers. By their nature, successful energy efficiency
4 DSM programs reduce the amount of energy sales made to customers. Because the
5 Company’s rates are volumetric based, i.e., based on the amount of energy
6 customers consume, programs that reduce that volume naturally reduce the amount
7 of net revenue received to pay for fixed costs.” (pp. 12-13).

8 Although Mr. Delizio’s statements are accurate, the degree to which fixed cost recovery
9 comes from energy (kWh) rates differs greatly between customer classes. For customers
10 with demand (kW) charges, most of the fixed costs are built into the demand and customer
11 charges, therefore, if kWh sales are reduced, under-recovery of fixed costs is far less likely
12 than for a customer class that does not have a demand charge and also has a relatively low
13 customer charge. In the latter class of customers, most of the fixed cost recovery is through
14 energy (kWh) charges; so if kWh sales decrease, under-recovery of fixed costs is a much
15 greater problem with that class. Therefore, the Company’s proposal to spread the UFC
16 evenly across all rate classes based on kWh consumption will tend to shift fixed cost
17 recovery away from those customers without demand charges to those customer classes with
18 demand charges. Fixed capacity costs are allocated to each rate class during a general rate
19 case based, in part, on cost-causation principles. Once the responsibility for fixed cost
20 recovery has been established for each customer class in a general rate case, that
21 responsibility should not be allowed to shift to other customer classes between general rate
22 cases.

1 **Q. DO YOU HAVE A RECOMMENDATION FOR THE COMMISSION REGARDING**
2 **THE UFC COMPONENT OF THE DSMAC?**

3 A. Yes. The UFC component of the DSMAC should be designed as a separate mechanism and
4 calculated separately for each rate class. That is, each rate class should have its own
5 independently calculated UFC mechanism. This recommendation is consistent with
6 company witness Mr. Pickles' direct testimony (p. 17, lines 2-3) description of Lost Revenue
7 Adjustment Mechanisms ("LRAMs") which involves "[m]ultiplying the net margin
8 component in *each rate class* by the DSM sales reductions in *that class.*" *[emphasis added]*
9 Failure to design rate-class-specific mechanisms will tend to cause the shifting of fixed-cost
10 recovery responsibility between rate classes, which is inconsistent with the long-standing
11 practice of allocating costs to rate classes based on cost-causation principles.

12 **Q. DO YOU HAVE ANY OTHER CONCERNS REGARDING THE PROPOSED UFC**
13 **MECHANISM?**

14 A. Yes. The Company has been very vague regarding the methodology for determining the
15 kWh impacts of utility DSM programs. The Commission may want to require additional
16 details on those method(s) built into the rules for UFC recovery. So as to not cause delay in
17 this case, the Commission should consider initiating a separate proceeding similar to a
18 rulemaking in which there can be more focused and thorough consideration of all aspects of
19 the DSMAC and to fully develop all necessary details for the tariff or Commission
20 regulations.

21
22 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

23 A. Yes, thank you.

Larry Blank

Education

Ph.D. in Economics, The University of Tennessee, Knoxville, August 1994.

Dissertation: "Political Economy and Public Utility Inefficiency."
Chair: Professor John W. Mayo (now at Georgetown University).

B.S. in Economics/Mathematics, Bemidji State University, Minnesota, May 1989.

Fields of Concentration

Industrial Organization & Public Policy
Econometrics
Finance (minor)

Professional Experience

Principal Consultant, TAHOEconomics, LLC, August 1999 - Present. Clients have included Government Agencies, Utility Customers, and Utility Companies focusing on most aspects of regulatory policy development and rate regulation in both the telecommunications and energy industries. From Jan. 2002 – Jan. 2005, Dr. Blank also served as the Director of a US Department of Energy grant project assisting the newly formed Energy Regulatory Commission of the Philippines as that agency completely restructured national policy related to the regulation of the electricity industry.

Assistant Professor, Department of Economics & International Business, New Mexico State University (NMSU), August 2003 – Present. Teaching graduate-level public utility regulation, business and government, and antitrust policy/economics.

Senior Associate, Center for Public Utilities, NMSU, August 2003 – Present. Center's training is endorsed by the National Association of Regulatory Utility Commissioners (NARUC).

Manager of Regulatory Policy and Market Analysis, Regulatory Operations Staff, Public Utilities Commission of Nevada, October 1997 - August 1999.

Responsibilities: Directed a ten-person division with duties covering most aspects of utility regulation and competitive restructuring across all industries (primarily telecommunications, electric, and natural gas); implementation of the Telecommunications Act of 1996; division management of all rates and tariffs; lead management of staff's electric and natural gas restructuring activities. Close coordination with legal division in litigated case preparation including lead negotiation experience.

Supervising Economist, Regulatory Operations Staff, Public Service Commission of Nevada, March 1996 - October 1997. Duties similar to those above.

Research Economist, National Regulatory Research Institute, The Ohio State University and the National Association of Regulatory Utility Commissioners (NARUC), September 1994 - March 1996.

Lecturer, School of Public Policy and Management, The Ohio State University (taught Graduate Public Finance).

Published Papers and Reports

"Promotions as Coopetition in the Soft Drink Industry," (with Mike Hyman and Michael Meade). *Academy of Marketing Studies Journal*, Forthcoming, 2008.

"A Dynamic Model of Insurgency: The Case of the War in Iraq," (with C.E. Enomoto, D. Gegax, T. McGuckin, and C. Simmons), *Peace Economics, Peace Science and Public Policy*, Vol. 14, No. 2, (lead author and lead article), 2008.

"The Role of Regulation in Expanding Access to Electricity: Reform in the Philippines," (with Mk Shean), *Energy Update*, Issue No. 4, 2005.

"Open Entry and Local Telephone Rates: The Economics of IntraLATA Toll Competition," (with David Kaserman, John Mayo, and Simran Kahai), *Review of Industrial Organization*, Vol. 14, No. 4, June 2000, pp. 303-319.

"Dominant Firm Pricing with Competitive Entry and Regulation: The Case of IntraLATA Toll," (with David Kaserman and John Mayo), *Journal of Regulatory Economics*, Vol. 14, 1998, pp. 35-53.

"Concavity Assumptions in Regulatory Models and the Capital Waste Controversy," *Journal of Regulatory Economics*, Vol. 9, 1996, pp. 95-100.

"Key Antitrust Pricing Issues for Regulated Industries with Emerging Competition," *NRRI Quarterly Bulletin*, Vol. 17, No. 2, 1996, pp. 279-298.

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"Telephone Vouchers: Experiences in Other Markets," *NRRI Quarterly Bulletin*, Vol. 16, No. 4, 1995, pp. 537-547.

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Economic Impact of Chem-Nuclear Systems, Inc. on Barnwell County, South Carolina (with Matthew Murray), for the U.S. Department of Energy. Energy, Environment and Resources Center, The University of Tennessee, Knoxville, November 1990.

Working Papers

“Benchmarking Electric Distribution Utilities in the Philippines,” (with Doug Gegax). **Revise and resubmit** at the *Asian Economic Journal*.

“Endogenous Regulatory Constraints and The Emergence of Hybrid Regulation,” (with John Mayo). **Revise and resubmit** at the *Review of Industrial Organization*.

“The FERC’s Sunk Cost and Original Purpose ‘Doctrine’ for Existing RTO Transmission Facilities” (with Doug Gegax).

“Can Regulators Stop the Tax Bleeding of Universal Service Support?” (with Bill Smith and Lucinda Blume).

Grants

U.S. Department of Energy, Technical Assistance to the Energy Regulatory Commission of the Philippines, January 2002 – January 2005.

U.S. Department of Energy, Sustainable Energy Development Program (Philippines), January 2005 – August 2005. Completed the Open Access Distribution Service Rules governing 140 electric distribution utilities.

Presentations and Conference Participation

“Can Regulators Stop the Tax Bleeding of the Universal Service Fund?” *Rutgers University Advanced Workshop in Regulation and Competition*, Sky Top, PA, May 2008.

Presentation: “Endogenous Regulatory Constraints and the Emergence of Hybrid Regulation,” *Western Economic Association Meetings*, Seattle, WA, July 2007.

Presentation: "PUHCA Uncertainty...States," *Western Governors' Association Energy Summit*, Albuquerque, NM, April 15, 2004.

Discussant, *Advanced Workshop in Regulation and Competition*, Monterey, CA, July 6, 2000.

Presentation: "Nevada Electric Restructuring," *Western Risk Management & Claims Workshop*, Western Electric Power Institute, San Diego, CA, July 8, 1999.

Discussant, *Advanced Workshop in Regulation and Competition*, San Diego, CA, July 7-9, 1999.

Participant, *Danish Ministry Workshop on Telecommunications Interconnection*, Special invitation by the Danish Ministry of Research and Information Technology, London, UK, December 14-15, 1998.

Presentation: "Regulatory Choice: Constraints and Inefficiency," *Advanced Workshop in Regulation and Competition*, Monterey, CA, July 10, 1998.

Presentation: "Regulatory Choice: Constraints and Inefficiency," *The 73rd Annual Western Economic Association Conference*, June 29, 1998.

Discussant, *The 25th Annual Telecommunications Policy Research Conference (TPRC)*, Alexandria, VA, September 27-29, 1997.

Presentation: "Electricity Restructuring Issues," two presentations before the *Nevada State Senate Committee on Commerce and Labor*, February 1997.

Presentation: "Regulating Market Penetration: A Higher-Powered Incentive Scheme for Local Exchange Companies," *The Tenth NARUC Biennial Regulatory Information Conference*, Hosted by the National Regulatory Research Institute at The Ohio State University, Columbus, September 11, 1996.

Presentation: "Regulating Market Penetration: A Higher-Powered Incentive Scheme for Local Telephone Companies," *The Advanced Workshop in Regulation and Public Utility Economics*, Hosted by the Center for Research in Regulated Industries at Rutgers University, Lake George, NY, May 30, 1996.

Presentation: "Balancing Seemingly Conflicting Goals through a Minimum Subscribership Plan: Economic Efficiency and the Risks Borne by Regulators," *The 27th Annual Conference of the Institute of Public Utilities*, Williamsburg, VA, December 12, 1995.

Presentation: "The Minimum Subscribership Plan (MSP): Quality, Prices, and Current Policy," *The 23rd Annual Telecommunications Policy Research Conference (TPRC)*, Solomons, MD, October 2, 1995.

Presentation: "A Positive Theory of Price-Cap and Rate-of-Return Regulation: Substitutes or Complements?", *Southern Economic Association Meetings*, Orlando, FL, November 22, 1994.

Journal Referee

The American Economic Review, April 1995.

Case Participation (partial list)

Electricity:

NV PUC, Docket No. 95-9022, Nevada Electric Restructuring Investigation (several extensive comments).

NV PUC, Docket No. 96-6013 and 96-6014, Sierra Pacific Power Company tariff filing to allow negotiated contracts (testimony).

NV PUC, Docket No. 96-7020, Nevada Power Company Deferred Energy Case (testimony).

NV PUC, Docket No. 97-5034, Rulemaking to establish standards of conduct and related requirements for distribution companies and affiliates.

NV PUC, Docket No. 97-6008, Nevada Power Company's Resource Plan (evaluation of load forecasting).

NV PUC, Docket No. 97-8001, Investigation of issues to be considered as a result of restructuring of electric industry (extensive comments and testimony on all restructuring issues including the development of new regulations).

NV PUC, Docket Nos. 97-11018 and 97-11028, Proposed Unbundling Methodologies of Sierra Pacific Power Co. and Nevada Power Co. (testimonies).

NV PUC, Docket No. 97-10004, Nevada Power Company's Green Power Tariff (testimony).

NV PUC, Docket No. 98-8034, Nevada Power Company, Application to Designate Unbundled Services as Potentially Competitive (testimony).

NV PUC, Docket No. 98-9038, Regulatory Operations Staff, Application to Designate Unbundled

Services as Potentially Competitive (testimony).

NV PUC, Docket No. 98-7023, Sierra Pacific Power Company and Nevada Power Company, Joint Application for Approval of Merger (testimony).

NV PUC, Docket No.s 98-12007 and 12009, Sierra Pacific Power Co. And Nevada Power Co. Applications for authorization to provide potentially competitive services through affiliates (testimony).

NV PUC, Docket No. 99-4019, Utility.com, Inc., Application for Licensing as an Alternative Seller (testimony).

NV PUC, Docket No. 99-10049, Petition for Advisory Opinion, Rules that may or may not apply to master-metered mobile home parks after restructuring of electric and natural gas markets, (testimony).

TX PUC, Docket No. 22349, Application of TX-NM Power Company for approval of unbundled cost of service rates (testimony filed).

Philippines Department of Energy and Energy Regulatory Board, Electricity Ratemaking Training and Rulemaking for Restructured Wholesale and Retail Electricity Industry (July 2000 – February 2001).

Philippines Energy Regulatory Commission, Project Director and key advisor for over three years on policy development related to industry restructuring and over 140 rate unbundling cases.

Philippines ERC, design of Open Access Distribution Services Rules.

Vermont Department of Public Service, Cost of Service analysis related to Green Mountain Power Corp.

AR PSC Docket No. 06-101-U, Application of Entergy for Changes in Electric Rates (testimony on behalf of the Federal Executive Agencies).

FERC Docket No. EL-07-101, AEP Protest of PJM Cost Allocation and Transmission Rate Design (testimony filed).

Natural Gas:

NV PUC, Docket No. 97-5034, Rulemaking to establish standards of conduct and related requirements for distribution companies and affiliates.

NV PUC, Docket No. 97-8002, Investigation into alternative form of regulation for natural gas local distribution companies and alternative sellers of natural gas, and related matters (extensive comments and testimony on all restructuring issues including the development of new regulations).

Telecommunications:

NV PUC, Docket Nos. 96-3002 and 96-3003, Nevada Bell's Entry into a Plan of Alternative Regulation (testimony).

NV PUC, Docket No. 96-9035, Investigation into Procedures and Methodologies to Develop Costs for Bundled or Unbundled Telephone Services (comments, testimony and cost analysis).

NV PUC, Docket No. 96-4041, Nevada Bell Petition on Confidential Nature of Telecommunications Cost Studies (testimony filed).

NV PUC, Docket No. 97-5018, Investigation into the impact of the Telecommunications Act of 1996 on Universal Service in Nevada (comments).

NV PUC, Docket No. 97-5027, Central Telephone Company-Nevada, tariff filing requesting an increase in directory assistance rates (testimony and cost analysis).

NV PUC, Docket No. 96-8035, GTE, Depreciation Filing (testimony).

NV PUC, Docket No. 97-11017, Virtual Hipster Corp., Petition to terminate rural exemption of Churchill County Telephone Company (testimony).

NV PUC, Docket No. 98-6004, Nevada Bell, Unbundled Network Element Costs (testimony).

NV PUC, Docket No. 98-6005, Sprint of Nevada, Unbundled Network Element Costs (testimony).

NV PUC, Review of Interconnection and Resale Agreements between Incumbent Local Exchange Carriers and Competitors for approval in Nevada.

NV PUC, Docket Nos. 98-10015 and 99-11007, Nevada Bell Arbitrations on the issue of reciprocal compensation and Internet service provider traffic.

Case No. CV771923, Superior Court of the State of California (Santa Clara), Worldcom v. Co-net Communications, Oral Expert Witness Testimony on potential service development including cost and revenue estimates, damage estimate, standard of care in circuit disconnect, and other circuit contractual issues (deposition and oral testimony), April 2000.

FCC CC Docket No. 00-247, Petition for Arbitration, Developed Unbundled Costs and Interconnection Agreement on behalf of Virtual Hipster Corp., December 2000.

NV PUC, Docket No. 00-7012, Nevada Bell Petition for order commencing a proceeding to determine new costs and rates for unbundled network elements (testimony filed on behalf of wholesale customers).

NM PRC, Case No. 05-00094-UT, Qwest Corporation's Amended Alternative Form of Regulation Plan, (testimony filed on behalf of Qwest regarding computation and appropriateness of refund).

Line Extension Policy and Contribution in Aid of Construction, expert witness work on behalf of 3 Rivers Telephone Cooperative, before the Montana Eighteenth Judicial District Court, Cause No. DV-04-731, March 2006.

MT PSC, Docket No. D2005.6.105, Investigation on Use of Federal Universal Service Funds (testimony filed on behalf of PSC advocacy staff).

Exhibit LB-2

2007 APS FERC Form No. 1, p. 398

Purchases and Sales of Ancillary Services

PURCHASES AND SALES OF ANCILLARY SERVICES

In columns for usage, report usage-related billing determinant and the unit of measure.

- | | | Amount Purchased for the Year | | | Amount Sold for the Year | | |
|----------|---|-------------------------------------|---------------------|-------------|-------------------------------------|---------------------|-------------|
| | | Usage - Related Billing Determinant | | | Usage - Related Billing Determinant | | |
| Line No. | Type of Ancillary Service (a) | Number of Units (b) | Unit of Measure (c) | Dollars (d) | Number of Units (e) | Unit of Measure (f) | Dollars (g) |
| 1 | Scheduling, System Control and Dispatch | 16,160,724 | MWh | 1,860,081 | 18,155,292 | MWh | 2,272,039 |
| 2 | Reactive Supply and Voltage | | | | | | |
| 3 | Regulation and Frequency Response | 13,977,132 | MWh | 6,736,313 | 13,977,132 | MWh | 7,073,141 |
| 4 | Energy Imbalance | | | | -18,068 | | -676,977 |
| 5 | Operating Reserve - Spinning | 13,977,132 | MWh | 15,404,976 | 13,977,132 | MWh | 16,173,465 |
| 6 | Operating Reserve - Supplement | 13,977,132 | MWh | 1,947,885 | 13,977,132 | | 2,068,453 |
| 7 | Other | | | | | | |
| 8 | Total (Lines 1 thru 7) | 58,092,120 | | 25,949,255 | 60,068,620 | | 26,910,121 |

ARIZONA PUBLIC SERVICE COMPANY
COMPUTATION OF INCREASE IN GROSS REVENUE REQUIREMENTS
ACC JURISDICTION
ADJUSTED TEST YEAR ENDED 12/31/2007
(Thousands of Dollars)

Line No.	Description	Original Cost	Electric RCND	Fair Value	Line No.
1.	Adjusted Rate Base	\$ 5,359,964 (a)	\$ 10,066,668 (a)	\$ 7,713,316	1.
2.	Adjusted Operating Income (Revised)	226,639 (b) **	226,639 (b)	226,639 (b)	2.
3.	Current Rate of Return	4.23%	2.25%	2.94%	3.
4.	Required Operating Income	474,893	474,893	474,893	4.
5.	Required Rate of Return	8.86%	4.72%	6.16%	5.
6.	Adjusted Operating Income Deficiency	248,254	248,254	248,254	6.
7.	Gross Revenue Conversion Factor	1.6491 (c)	1.6491 (c)	1.6491 (c)	7.
8.	Requested Increase in Base Revenue Requirements	\$ 409,396	\$ 409,396	\$ 409,396	8.

Customer Classification	Company-Projected Revenue Increase Due to Rates	% Increase	Total Projected Revenue Increase Net of PSA	% Increase Net of PSA
9. Residential	232,650	17.27%	152,791	11.34%
10. General Service	207,600	16.74%	120,383	9.71%
11. Irrigation	3,121	12.30%	1,132	4.46%
12. Outdoor Lighting	3,372	19.41%	2,614	15.05%
13. Dusk-to-Dawn	1,451	19.36%	1,297	17.30%
14. Total APS-Requested Increase in Base Revenue Requirements	\$ 448,194	16.99% *	\$ 278,217	10.55% *
15. Total Sales to Ultimate Retail Customers	\$ 2,637,447 (d)			

Notes

* The \$448.2M revenue increase requested above for base rates includes \$183.9M due to the Company's request to increase the base fuel rate from 3.25¢/kWh (as authorized in Decision No. 69663) to 3.88¢/kWh. \$170.0M of the increase associated with the base fuel increase would have been charged to customers under the provisions of the PSA. Therefore the effective increase to customer rates net of the reduced PSA charges is actually 10.55% or \$278.2M. This increase could be further reduced by approximately 2% if the proposed Impact Fee is approved to recover a portion of the proposed revenue requirement related to the attrition proforma adjustment.

Supporting Schedules

- (a) B-1
(b) C-1, page 2 of 2. **Revised to reflect direct assignment of Ancillary Service costs to FERC jurisdiction.
(c) C-3
(d) H-1

Recap Schedules:

N/A